Claims

1. A method of connecting plural table-format data, each being expressed as a record array containing an entry and an entry value included in the entry, and converting the connected table-format data as join tables to a tree structure, the method characterized by comprising:

a) a step of dividing each table-format data into one or more information blocks, each containing a value list in which entry values belonging to specified entries are stored in order of entry value numbers corresponding to the entry values and a pointer array in which pointer values for indicating the entry value numbers are stored in univocal order of record numbers;

b) a step of selecting two table-format data in which an entry should be made common;

c) a step of finding an entry that should be made common in the selected two table-format data;

d) a step of determining table-format data on which default sorting order is reflected, as master table-format data, of the specified information blocks, and determining the other table-format data as slave table-format data;

e) a step of associating a record the master side with a corresponding record on the slave side in the selected table-format data in the case where the value lists contained in the specified information blocks are equalized with each

other;

f) a step of selecting two other table-format data that regard the table-format data on the slave side of the former two table-format data, as the master side, and executing the step c) of finding an entry, the step d) of determining master table-format data and slave table-format data, and the step e) of associating, with respect to the other two table-format data;

g) a step of repeating the step f) with respect to table-format data that need to be joined;

h) a step of selecting table-format data to be a root from the table-format data connected by joining, and determining depth of each table-format data in accordance with the connection of the table-format data;

i) a step of securing an area for a tree description table having a combination of the depth and a record number, as a value;

j) a step of specifying a record having certain depth that is initially the smallest depth, and arranging a value indicating the record together with the depth into the area for the tree description table;

k) a step of specifying a record of the table-format data on the slave side from the specified record, and arranging, on the basis of the record, a value indicating a record of table-format data that regards the table-format data on the

slave side as the master side, together with the depth of the table-format data on the master side, into the area for the tree description table;

l) a step of repeating the step k) until depth where no table format data exist is reached or until no record exists any longer; and

m) a step of repeating the steps j) to l) to arrange a value specifying predetermined depth and record into the area for the tree description table, and thus completing the tree description table.

2. The method as described in claim 1, characterized in that the step e) comprises:

a step of generating, in the information block on the master side, a second projection array for indicating the pointer array of the information block along with addition of the entry value when equalizing the value list;

a step of generating, in the information block on the slave side, a third projection array that sums up the number of values of entries that are made common; and

a step of generating, in the information block on the slave side, a fourth projection array, which is a set of values indicating records sorted by the entries that are made common;

wherein the second projection array, the pointer array of the information block on the master side, the third projection array and the fourth projection array are

sequentially traced to specify a record on the slave side.

3. The method as claimed in claim 2, characterized by further comprising

n) a step of generating a reverse mapping array of the second projection array related to the master side, except for the table-format data having the smallest depth,

wherein an element of the reverse mapping array indicated by an element from the fourth projection array specifies an element of the second projection array on the master side in the table-format data having the second smallest depth.

4. The method as claimed in claim 3, characterized in that the step of generating a reverse mapping comprises:

a step of arranging an array for reverse mapping containing the same number of elements as the elements of the second projection array related to the master side;

a step of arranging another value that cannot specify a record, as each of the elements; and

a step of providing a value to the reverse mapping array, using a position of the fourth projection array as an element and regarding an element as a position.

5. The method as claimed in one of claims 1 to 3, characterized by further comprising a step of performing one of search, totaling and sorting with respect to the entry that should be made common of the table-format data, of at least one of the two table-format data in which the entry should be

made common.

6. A program for connecting plural table-format data, each being expressed as a record array containing an entry and an entry value included in the entry, and converting the connected table-format data as join tables to a tree structure, the program characterized by causing the computer to execute:

a) a step of dividing each table-format data into one or more information blocks, each containing a value list in which entry values belonging to specified entries are stored in order of entry value numbers corresponding to the entry values and a pointer array in which pointer values for indicating the entry value numbers are stored in univocal order of record numbers;

b) a step of selecting two table-format data in which an entry should be made common;

c) a step of finding an entry that should be made common in the selected two table-format data;

d) a step of determining table-format data on which default sorting order is reflected, as master table-format data, of the specified information blocks, and determining the other table-format data as slave table-format data;

e) a step of associating a record the master side with a corresponding record on the slave side in the selected table-format data in the case where the value lists contained in the specified information blocks are equalized with each

other;

f) a step of selecting two other table-format data that regard the table-format data on the slave side of the former two table-format data, as the master side, and executing the step c) of finding an entry, the step d) of determining master table-format data and slave table-format data, and the step e) of associating, with respect to the other two table-format data;

g) a step of repeating the step f) with respect to table-format data that need to be joined;

h) a step of selecting table-format data to be a root from the table-format data connected by joining, and determining depth of each table-format data in accordance with the connection of the table-format data;

i) a step of securing an area for a tree description table having a combination of the depth and a record number, as a value;

j) a step of specifying a record having certain depth that is initially the smallest depth, and arranging a value indicating the record together with the depth into the area for the tree description table;

k) a step of specifying a record of the table-format data on the slave side from the specified record, and arranging, on the basis of the record, a value indicating a record of table-format data that regards the table-format data on the

slave side as the master side, together with the depth of the table-format data on the master side, into the area for the tree description table;

l) a step of repeating the step k) until depth where no table format data exist is reached or until no record exists any longer; and

m) a step of repeating the steps j) to l) to arrange a value specifying predetermined depth and record into the area for the tree description table, and thus completing the tree description table.

7. The program as described in claim 6, characterized by causing the computer to execute, at the step e):

a step of generating, in the information block on the master side, a second projection array for indicating the pointer array of the information block along with addition of the entry value when equalizing the value list;

a step of generating, in the information block on the slave side, a third projection array that sums up the number of values of entries that are made common; and

a step of generating, in the information block on the slave side, a fourth projection array, which is a set of values indicating records sorted by the entries that are made common;

the program being characterized by causing the computer to operate so that the second projection array, the pointer array of the information block on the master side, the third

projection array and the fourth projection array are sequentially traced to specify a record on the slave side.

8. The program as claimed in claim 7, characterized by further causing the computer to execute

n) a step of generating a reverse mapping array of the second projection array related to the master side, except for the table-format data having the smallest depth,

the program being characterized by causing the computer to operate so that an element of the reverse mapping array indicated by an element from the fourth projection array specifies an element of the second projection array on the master side in the table-format data having the second smallest depth.

9. The program as claimed in claim 8, characterized by causing the computer to execute, at the step of generating a reverse mapping:

a step of arranging an array for reverse mapping containing the same number of elements as the elements of the second projection array related to the master side;

a step of arranging another value that cannot specify a record, as each of the elements; and

a step of providing a value to the reverse mapping array, using a position of the fourth projection array as an element and regarding an element as a position.

10. The program as claimed in one of claims 6 to 9,

characterized by further causing the computer to execute a step of performing one of search, totaling and sorting with respect to the entry that should be made common of the table-format data, of at least one of the two table-format data in which the entry should be made common.